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MCZ newsletter

MUSEUM OF COMPARATIVE ZOOLOGY

PROFESSOR MAYR LECTURES IN RUSSIA

Professor Ernst Mayr recently spent several weeks presenting seminars and lectures in Russia at the invitation of the Akademiia Nauk SSSR. He spoke in several museums and institutes on the history and philosophy of biology, on current problems of speciation and other aspects of evolution. The trip made it possible for Dr. Mayr to meet colleagues with whom he has corresponded during the past 30 years. Four of Professor Mayr's books have been published in Russian.

Professor Mayr was accompanied by his wife, Gretel.

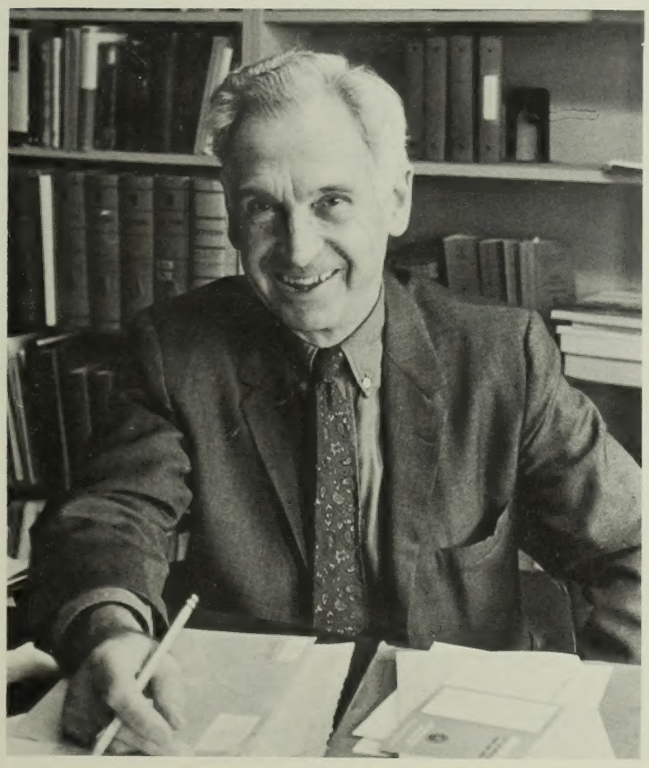


Photo by Rick Stafford

Professor E. Mayr

DISTINGUISHED VISITING SCIENTISTS LECTURE IN ANIMAL PHYSIOLOGY COURSE

Last semester the Museum appointed Jürgen Aschoff and Knut Schmidt-Nielsen as Visiting Alexander Agassiz Professors. They participated in a large introductory course for 130 undergraduate and graduate students. The course, entitled Topics in Animal Physiology, provided a rare opportunity for undergraduate students to listen to men who have helped define the field of vertebrate physiology and have made some of the most basic contributions in this area. The student and staff response to the course has been unanimously enthusiastic.

Both professors lived in undergraduate houses during their stay at Harvard (Winthrop and Currier Houses), and they spent considerable time informally with students at science tables and at various seminars and colloquia around the University. Professor Aschoff collaborated on research with Professor John Hastings and his graduate students during his visit. Professor Schmidt-Nielsen did the same with Professor Taylor and some of his graduate students.

Professor Aschoff is Director of the Max-Planck-Institut für Verhaltenphysiologie. He was born in 1913 and received his degree of Doctor of Medicine with a specialization of physiology from Goettingen and Freiburg. Dr. Aschoff has made fundamental contributions to the understanding of temperature regulation, physiological heat exchangers and animal energetics. Recently he and his collaborators have been concentrating their research on biological clocks and biological rhythms. They have built large underground bunkers in which people and other organisms can be isolated from environmental clues. They have explained such puzzling phenomena as "early" and "late" risers, the reasons for the differences in time required to adjust to east to west versus west to east, transcontinental air plane flights, and are currently investigating the fundamental nature of how the biological clocks work.

ALEXANDER AGASSIZ PROFESSORS APPOINTED

Two Harvard University professors, Herbert Walter Levi and Ernest Edward Williams, have recently been appointed as Alexander Agassiz Professors of Zoology. Professors Levi and Williams are also curators of departments in the MCZ. The professorships were established in 1910 through a bequest made by Alexander Agassiz for the purpose of attracting distinguished scientists to the Museum and recognizing their achievements.

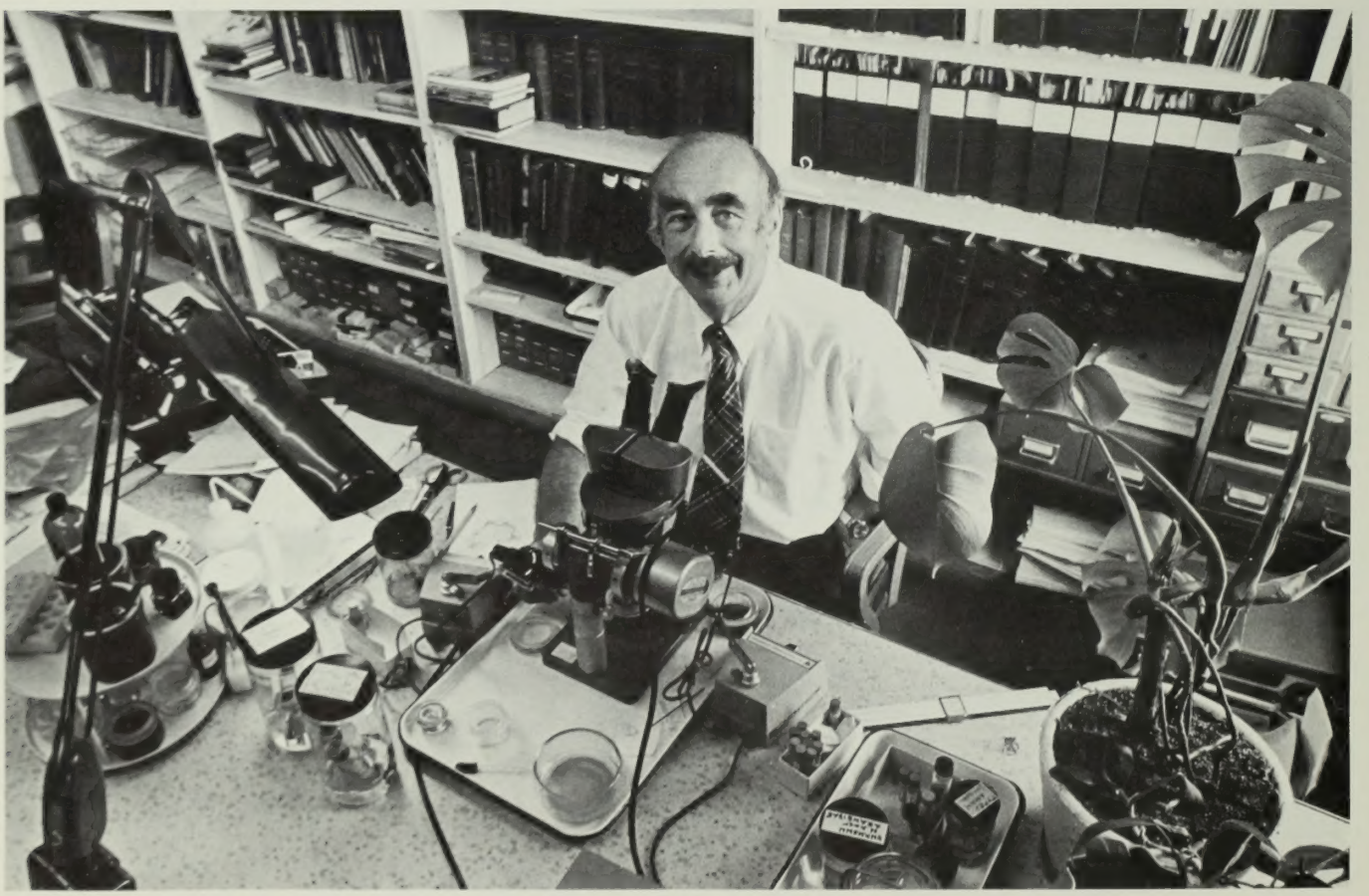
Professor Herbert Walter Levi

Professor Levi is engaged in systematic studies of the orb weaving spiders of the family Araneidae. He is particularly interested in evolutionary relationships among the Araneidae and the evolution of the orb web. During the last three years he has illustrated specimens in more than 300 genera of the family and 60% of the types of described American species. At present he is working on species north of Mexico and will later continue this work in Mexico and Central and South America on spiders belonging to genera not represented north of Mexico. Dr. Levi recently completed the revision of the family Theridiidae which he began in 1954.

Dr. Levi states that few systematic revisions of American spiders exist and that many North American spiders cannot be readily determined. He cites the need of economic entomologists to determine spiders in their study of insect predators. Orb weavers are particularly important because they may trap in their webs many more insects than they consume. Determinations of spiders are also important to toxicologists: some spiders bite, some are venomous and a few may even cause necrotic lesions in man. His most recent publications include revisions of the orb weaver genera *Neoscona, Eriophora, Gea, Argiope,* and the *diadematus* group of *Araneus,* thus making it possible for other workers to accurately identify these common and important spiders.

Besides teaching the Invertebrate Zoology course, Dr. Levi conducts a freshman seminar on spiders. He has made numerous major contributions to arachnid literature and recently published his translation and revision of Kaestner's 3-volume text on invertebrate zoology. He is also author of the popular handbook, *Spiders and Their Kin* (The Golden Press, 1971, 6th rev. printing), which is now being printed in Dutch and Spanish. The latter translation is by Dr. J.W. Abalos, a colleague.

Photo by Rick Stafford



Professor H. W. Levi

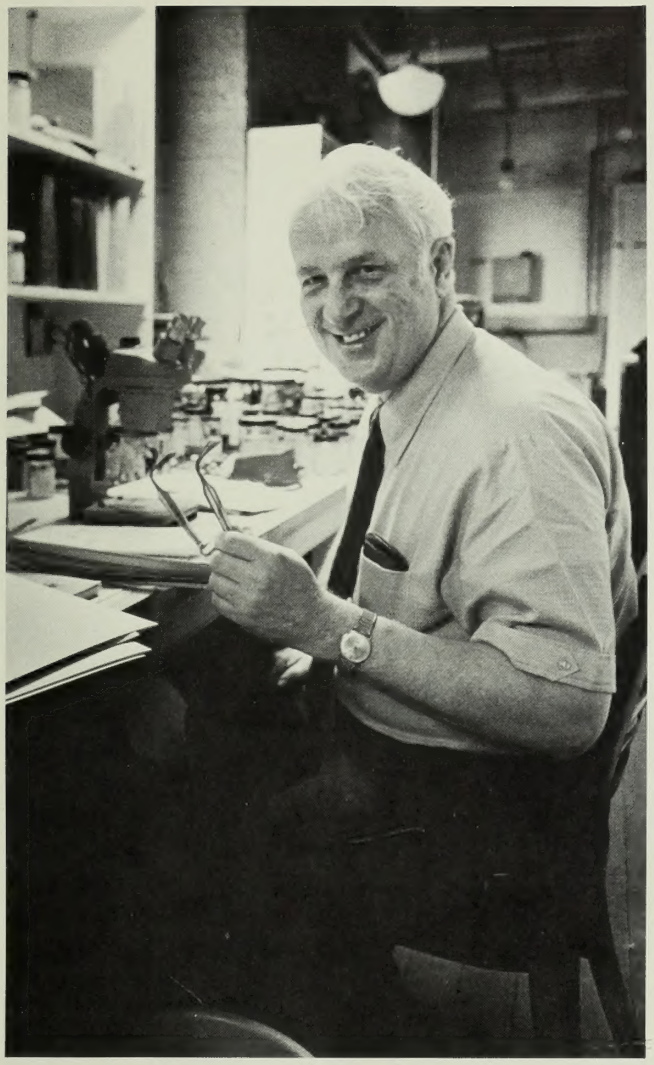


Photo by Rick Stafford

Professor E. E. Williams

Professor Ernest Edward Williams

Professor Bryan Patterson submitted the following information about Professor Williams.

Professor Williams has been compared by one of his Brazilian colleagues to " 'M', that omniscient eminence of the British Secret Service who directed the activities of James Bond and other agents." This is not too far-fetched because Williams' agents, too, tend to be widely spread over the earth to the benefit of the MCZ and its herpetological collections and researches. He has his man in New Guinea. He has had agents in the Solomons. His students scour the Antilles and make forays on the Spanish Main.

He began rather modestly, one might say almost ploddingly, because his first interest lay in turtles. He did well by them, too. With Arthur Loveridge, he monographed the cryptodires of Africa, and he has contributed a number of papers linking recent and fossil members of the group. His doctoral dissertation was on the vertebrae of turtles, and his interests in structure and development of the vertebral column has continued, culminating in the fundamental study of the development of tetrapod vertebrae.

His first ventures into field work were in the West Indies, a region he found fascinating from the many evolutionary and zoogeographic problems it presented. An iguanid lizard, *Anolis,* is one of the most widespread vertebrates in the West Indies and also over much of Central and South America. His later research has focused largely on an evolutionary and ecological study of the numerous species that make up this genus. Together with an active group of colleagues that includes present and former students, he is carrying out a wide-ranging series of researches that involve the application of a variety of techniques and approaches -- elaborate field studies of behavior, meticulous investigations of structure, chromosomal relationships, thermo-regulatory systems, ecological preferences and the like. *Anolis* is already one of the better known vertebrates. As these studies continue to unfold, it bids fair to become a household word in evolutionary biology.

Professor Williams recently completed work on a paper for Evolutionary Biology in which he analyzes the *Anolis* fauna of Puerto Rico and discusses how specifically and ecologically diverse communities are formed.

PROFESSOR SCHULTES SPEAKS ON CANNABIS TO FRIENDS OF MCZ

On May 30th, the Friends of the MCZ heard a fascinating lecture by a world authority on hallucinogenic plants. Professor Richard Evans Schultes, Director of the Botanical Museum (a sister Museum to the MCZ), discussed the botany and history of Cannabis.

Professor Schultes has spent over 30 years studying hallucinogenic plants. He began collecting plants in Mexico in 1938 and has worked in the Amazon jungles from 1941 to 1953. He was sent to South America by the U.S. Government in search of rubber trees after supplies of natural rubber from Southeast Asia were cut off by World War II. The many rubber plantations which were established in South America after the war are a direct result of his research. He remained in the jungles of Colombia and Peru until 1953, studying and collecting orchids and plants used by native Indians as narcotics and other drugs. He brought back to Harvard some 48,000 specimens. He has continued his intense study of these plants and has published more than 100 scientific papers. Recently, he collaborated with

Professor Schultes with the Waiká Indians of Amazonian Brazil

Dr. Albert Hofmann, discoverer of LSD, on a book, *The Botany and Chemistry of Hallucinogens.* (In press.)

Dr. Schultes has specialized in the taxonomy of economic plants of the New World: flora of the northwest Amazon, orchids of the New World tropics, rubber and other latex plants. Since joining the Botanical Museum staff in 1953, he has taught courses in Harvard University and has conducted field courses in Cuba, Colombia, the Andean highlands and the Amazon. He has taught economic botany in Spanish at the Universidad Nacional de Colombia, Bogota, under the auspices of the State Department, Alliance for Progress.

Professor Schultes is a Member of the National Academy of Sciences and the Explorers Club. He is a Fellow of the American Academy of Arts and Sciences, Linnaean Society (London), the Colombian Academy of Sciences and the American College of Neuropsychopharmacology. In 1953, he was given an honorary degree from the Universidad Nacional de Colombia (MH) and in 1969 was decorated by the Colombian government with the Orden de la Victoria Regia for research in the Amazon.

Concord Field Station Notes

PROFESSORS ROBERTSHAW AND TAYLOR CONDUCT RESEARCH ON THE SWEAT GLAND

David Robertshaw, Professor and Head of the Department of Animal Physiology, University of Nairobi, Kenya, conducted research with Professor C. Richard Taylor during the spring. Professors Robertshaw and Taylor worked together in East Africa from 1966-1968. In general, they are interested in the evolution of the sweat gland as a heat loss mechanism in mammals and want to determine whether the sweat gland always had a thermoregulatory function. They have found that the sweat glands of equines are controlled by a dual system. Heat-induced and exercise-induced sweating are controlled by adrenergic nerves. However, during exercise the secretion of the adrenal medulla, adrenaline, supplements the neural component. There are therefore both neural and humoral (i.e., blood-borne) components. It is felt that these systems may

have evolved independently and yet are somewhat interdependent.

In man and certain primates the sweat glands are stimulated by the neural release of acetylcholine, that is they are cholinergic. However, they can be stimulated by adrenaline. Professors Robertshaw and Taylor are therefore now investigating the possibility of man and primates having a dual system of sweat gland control. They are using stump-tailed macaques to determine whether adreno-medullary secretion modifies cholinergic transmission during exercise.

Professors Robertshaw and Taylor also studied in Africa the evaporative heat loss mechanisms of several species of East African bovid. The two principal evaporative heat loss mechanisms are panting and sweating. They found, among other things, that there seems to be a relationship between adult body size and the type of heat loss mechanism utilized. Thus, larger species such as the eland or buffalo use sweating as their main evaporative heat loss mechanism, whereas the smaller species (e.g. the gazelles) are panting animals. An exception to this rule was noted in the wildebeest, which is an animal as big as cattle, a sweating species. This animal, although it has sweat glands, shows little increase in cutaneous moisture loss with heat exposure. However, the animal pants with great vigor. Anatomical studies indicated that the wildebeest has specific structural adaptations that allow it to lose heat from the upper respiratory tract.

In addition, Professors Robertshaw and Taylor are studying marsupials, which are reported to have a complete dissociation of sweating and panting; panting is utilized under heat exposure and sweating during exercise.

Professor D. Robertshaw

Photo by Rick Stafford

NIKE MISSILE SITE CONVERTED TO NEW RESEARCH FACILITY

A new experimental facility for population, environmental, and behavioral studies is now under construction at the Concord Field Station. The construction, funded by the Ford Foundation, includes conversion of the underground Nike Missile bunkers at the Station into large controlled environmental study chambers. Each bunker will provide approximately 3,000 square feet of laboratory space; the bunkers are buried underground, and therefore maintain the vital stable temperatures easily and inexpensively. Classrooms and laboratories will be built on top of the bunkers. The laboratories will include sleeping accommodations. A central eating area for research workers is also planned.

Researchers using the facility will include members of several science departments at Harvard. Dr. C. Richard Taylor, Director of the Station, commented that availability of such an environmental study center will foster the exchange of information and interchange of ideas among scientists involved in various field projects. In order to further develop interdisciplinary communication, a seminar program has also been organized for all of the investigators working at the Field Station and their students.

Professor Howard Evans, who has made extensive investigations concerning the behavior of solitary wasps, will use the new facility in his examination of initial stages of sociality in *Philanthus gibbosus*. This is a ground-nesting wasp occurring naturally in the Field Station area. Although this is a solitary wasp, emerging adults tend to reoccupy the nest of the mother and to establish temporary associations of several males and females. Through use of artificial nests placed between sheets of glass, Professor Evans will observe how these associations within the burrow are established and will study the interactions between nest sharers. He also hopes to carry out experiments to determine whether these wasps prey exclusively on bees because their nervous system is so coded or because the adults "remember" what they fed on as larvae.

Professors Carroll M. Williams, Lynn Riddiford and Andrew Spielman are using the underground facilities for simulated field tests of hormonal means of insect control. The initial studies will involve the administration of analogs of the insects' own hormones to mosquitoes and to cockroaches. In laboratory studies, when juvenile hormone is given to these insects during late larval life, it prevents metamorphosis into reproducing adults. When it is given to adult females, it has an ovicidal effect. Therefore these agents should theoretically give complete control in these large population cages. These juvenile hormone analogs are biodegradable and have not been found to have any toxic effects on vertebrates. Consequently, if they work as expected they will be a good alternative to DDT and other conventional insecticides.

Biological clocks are widespread throughout the plant and animal kingdoms. In the latter, these clocks control various and diverse physiological and behavioral functions. In man these include cyclic variations in activity, body temperature, alertness, and sensitivity to drugs. Dr. James Truman (Biological Laboratories) is studying the environmental and physiological aspects of circadian clocks. Because of their tolerance of surgical manipulation and their ease of handling, he is concentrating his studies on insect systems. It is hoped that the information can then be extrapolated to other animals, including man.

Professor Otto Solbrig is to carry out research on the population dynamics of plants. Using the new facility, he will attempt to separate environmental and genetic components. Using the experimental garden at the Station, and the natural plant community nearby in his research, he is trying to find out what determines the composition of a particular plant community and the ability of plant species to adapt to environmental change.

Many thanks to Rick Stafford of the Harvard University Gazette who once again contributed nearly all of the photographs to the Newsletter. Also, I wish to express appreciation to Professor C. Richard Taylor and Dr. Rosanne Leidy for their help with the production of this issue.

(Ms.) Hedy Mattson

PRESIDENT OF FRIENDS WRITES BIOGRAPHICAL WORK ON RACHEL CARSON

Paul Brooks, President of the Friends of the MCZ, has just written and had published a "literary biography" of Rachel Carson. Entitled *The House of Life,* it is based on Miss Carson's personal and professional correspondence, speeches and interviews, and contains passages from her works, including *The Sea Around Us* and *Silent Spring.*

Mr. Brooks who lives in Lincoln, Massachusetts, was editor-in-chief at Houghton Mifflin until 1969 when he retired from his executive duties to devote more time to his own writing. He is author of numerous magazine articles and two books, *Roadless Area* (1964) and *The Pursuit of Wilderness* (1971). He received the John Burroughs Medal and the Sarah Chapman Francis Medal of the Garden Club of America for *Roadless Area.* Stewart Udall has stated, "Brooks is a modern Thoreau, filled with radical, healing forthrightness."

Mr. Brooks has served as President of the Friends of the MCZ since the organization's inception and is a member of the Visiting Committee.

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